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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/857,281	06/01/2001	Stefan Schaffler	P01,0158	4895

7590 02/04/2005

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EXAMINER

THANGAVELU, KANDASAMY

ART UNIT	PAPER NUMBER
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2123

DATE MAILED: 02/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/857,281

Applicant(s)

SCHAFFLER ET AL.

Examiner

Kandasamy Thangavelu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This communication is in response to the Applicants' amendment dated on November 24, 2004. Claims 7, 9 and 10 were amended. Claims 1-10 of the application are pending. This office action is made non-final.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. §112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-10 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

3.1 Amended Claim 1, Line 1 states, "A method for designing a technical system" and Lines 7-8 state, "d) applying said substitute model adapted with regard to its quality in a design of said technical system".

Specification Page 1, Para 0003, Lines 1-3 state, "The object of the invention is to make it possible for a technical system to be designed on the basis of measurement data of a

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predetermined system”. Specification, Page 2, Para 0006, states, “The substitute model adapted with regard to its quality is used for designing the technical system”. Page 7, Para 0041, Lines 1-2 state, “Figure 1 shows a block diagram which contains steps of a method for designing a technical system”. Page 8, Para 0041, Lines 2-4 state, “Once an appropriately high quality for the substitute model has been determined, this substitute model is used for designing the technical system”.

Designing a technical system involves specifying the functional, performance, reliability, safety, cost and other requirements of the system; identifying the system configuration in terms of subsystems and components to meet the specifications; modeling the system using mathematical models and simulating the operation of the system to verify that the system will perform as specified; applying an iterative process to continuously refine the configurations and the models based on the simulation results and performing further simulations. The process terminates when a design that meets all specifications has been identified.

Therefore, the specification does not describe a method of designing the technical system; and providing a substitute model that describes measurement data of a predetermined system does not constitute designing a technical system.

3.2 Claim 8, Line 1 states, “The method as claimed in claim 1, further comprising the step of: controlling a technical plant utilizing said data obtained by designing”.

As explained in Paragraph 3.1 above, the specification does not describe a method of designing the technical system. Therefore “the data obtained by designing” is undefined.

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3.3 Amended Claim 10, Line 1 states, “An apparatus for designing a technical system” and Lines 9-10 state, “wherein said substitute model adapted with regard to its quality is used for designing said technical system”.

For the reasons explained in Paragraph 3.1 above, the specification does not describe an apparatus for designing a technical system; and using the substitute model adapted with regard to its quality for designing said technical system.

Claim Interpretations

4.1 In Claim 1, “A method for designing a technical system” has been interpreted as “A method of controlling a technical system”; and “d) applying said substitute model adapted with regard to its quality in a design of said technical system” has been interpreted as “d) applying said substitute model adapted with regard to its quality in controlling a technical system”.

4.2 In Claim 8, “controlling a technical plant utilizing said data obtained by designing” has been interpreted as “controlling a technical plant utilizing said data obtained by applying said substitute model”.

4.3 In Claim 10, “An apparatus for designing a technical system” has been interpreted as “An apparatus for controlling a technical system”; and “wherein said substitute model adapted with regard to its quality is used for designing said technical system” has been interpreted as “wherein

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said substitute model adapted with regard to its quality is used for controlling a technical system”.

4.4 Claims 1-10 use the terms “numerical value for a quality” or “measurement data ... quality”. Specification Page 7, Para 0041, Lines 12-15 state, “Each item of measurement data preferably receives a numerical value for quality, which numerical value characterizes the deviation of the item of the measurement data from the associated value determined by the substitute model”. Therefore, the “measurement data ... quality” and the “numerical value for a quality” are interpreted to be synonymous with the deviation of the measured data from the data predicted by the substitute model.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 1-7 are rejected under 35 U.S.C. 101 because the claimed inventions are directed to non-statutory subject matter.

Method claims 1-7 are rejected for reciting a process that is not directed to the technological arts.

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Regarding independent claim 1, this claim is directed at a method for designing a technical system, whereas none of the limitations describe any type of computer-implemented steps. To be statutory, the utility of an invention must be within the technological arts. *In re Musgrave*, 167 USPQ 280, 289-90 (CCPA, 1970). The definition of “technology” is the “application of science and engineering to the development of machines and procedures in order to enhance or improve human conditions, or at least to improve human efficiency in some respect.” (Computer Dictionary 384 (Microsoft Press, 2d ed. 1994)).

Dependent claims 2-7 depend on Claim 1 but do not add further statutory steps.

The limitations recited in claims 1-7 contain no language suggesting these claims are intended to be within the technological arts.

7. Claims 1-7 would be allowable if claim 1 is rewritten as a computer implemented method for controlling a technical system

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

9. Claims 1-3 and 8-10 are rejected under 35 U.S.C. § 102(e) as being anticipated by **Klimasauskas et al.** (U.S. Patent 6,278,962).

9.1 **Klimasauskas et al.** teaches hybrid linear neural network process control. Specifically, as per claim 1, **Klimasauskas et al.** teaches a method for designing a technical system (CL1, L11-12), comprising the steps of:

providing a substitute model that describes measurement data of a predetermined system (CL3, L22-25; CL3, L25-29; CL3, L2-3);

determining a numerical value for a quality of the substitute model by comparing the measurement data of the predetermined system with data determined by the substitute model (CL3, L30-33; CL7, L53-57);

adapting the substitute model from the numerical value for the quality to be as high of a quality as possible (CL3, L40-42; CL6, L42-48); and

applying the substitute model adapted with regard to its quality in a design of the technical system (CL3, L22-37; CL5, L6-9; CL5, L34-45).

Per claim 2: **Klimasauskas et al.** teaches that the substitute model is a regression model (CL8, L50-52; CL8, L55-57).

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Per claim 3, **Klimasauskas et al.** teaches the step of determining a numerical value for a quality further utilizes a mean square deviation of the measurement data from the data determined by the substitute model (CL8, L40-41; CL8, L50-52).

Per claim 8: **Klimasauskas et al.** teaches controlling a technical plant utilizing the data obtained by designing (CL1, L11-12; CL5, L6-9; CL5, L34-45).

Per claim 9: **Klimasauskas et al.** teaches online adaptive control for the technical plant (CL1, L11-12).

9.2 As per claim 10, **Klimasauskas et al.** teaches an apparatus for designing a technical system, comprising a processor unit (fig. 1; Fig. 2; CL5, L6-9; CL5, L34-45); which is set up in such a way that

measurement data of a predetermined system are described based on a substitute model and stored in the processor unit (CL3, L22-25; CL3, L25-29);

a numerical value for a quality of the substitute model is determined by the processor unit by comparing the measurement data of the predetermined system with data determined by the substitute model (CL3, L30-33; CL7, L53-57); and

the substitute model is adapted, utilizing the processor unit, from the numerical value for the quality to be as of high a quality as possible (CL3, L40-42; CL6, L42-48);

wherein the substitute model adapted with regard to its quality is used for designing the technical system (CL3, L22-37; CL5, L6-9; CL5, L34-45).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

11. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Klimasauskas et al.** (U.S. Patent 6,278,962) in view of **Amado** (U.S. Patent 5,701,400).

12.1 As per claim 4, **Klimasauskas et al.** teaches the method of Claim 1. **Klimasauskas et al.** teaches the deviation of the latter (measurement data) from the data determined by the substitute model (CL8, L40-41; CL8, L50-52). **Klimasauskas et al.** does not expressly teach sorting the measurement data according to their quality, with respect to the deviation of the latter

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from the data determined by the substitute model. **Amado** teaches sorting the measurement data according to their quality, with respect to the deviation of the latter from the data determined by the substitute model (CL67, L32-34), because that would allow elimination of irrelevant information (CL17, L55). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Klimasauskas et al.** with the method of **Amado** that included sorting the measurement data according to their quality, with respect to the deviation of the latter from the data determined by the substitute model. The artisan would have been motivated because that would allow elimination of irrelevant information.

Klimasauskas et al. does not expressly teach picking out a predetermined number of n% of worst measurement data. **Amado** teaches picking out a predetermined number of n% of worst measurement data (CL37, L4-5), because that would allow elimination of irrelevant information (CL17, L55). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Klimasauskas et al.** with the method of **Amado** that included picking out a predetermined number of n% of worst measurement data. The artisan would have been motivated because that would allow elimination of irrelevant information.

12.2 As per claim 5, **Klimasauskas et al.** teaches the method of Claim 1. **Klimasauskas et al.** teaches the deviation of the latter (measurement data) from the data determined by the substitute model (CL8, L40-41; CL8, L50-52). **Klimasauskas et al.** does not expressly teach sorting the measurement data according to their quality, with respect to the deviation of the latter from the data determined by the substitute model. **Amado** teaches sorting the measurement data according to their quality, with respect to the deviation of the latter from the data determined by

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the substitute model (CL67, L32-34), because that would allow elimination of irrelevant information (CL17, L55). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Klimasauskas et al.** with the method of **Amado** that included sorting the measurement data according to their quality, with respect to the deviation of the latter from the data determined by the substitute model. The artisan would have been motivated because that would allow elimination of irrelevant information.

Klimasauskas et al. does not expressly teach picking out a predetermined number of n% of worst measurement data unless this data lie in a continuous range. **Amado** teaches picking out a predetermined number of n% of worst measurement data unless this data lie in a continuous range (CL37, L4-5), because that would allow elimination of irrelevant information (CL17, L55). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Klimasauskas et al.** with the method of **Amado** that included picking out a predetermined number of n% of worst measurement data unless this data lie in a continuous range. The artisan would have been motivated because that would allow elimination of irrelevant information.

13. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Klimasauskas et al.** (U.S. Patent 6,278,962) in view of **Hoffberg et al.** (U.S. Patent 5,920,477).

13.1 As per claims 6 and 7, **Klimasauskas et al.** teaches the method of Claim 1.

Klimasauskas et al. does not expressly teach reducing an amount of measurement data in the course of a preprocessing operation; and classifying, in which the preprocessing operation, of the

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measurement data. **Hoffberg et al.** teaches reducing an amount of measurement data in the course of a preprocessing operation; and classifying, in which the preprocessing operation, of the measurement data (CL27, L38-42), because that would allow eliminating data not necessary to characterize the program (CL27, L41-42). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Klimasauskas et al.** with the method of **Hoffberg et al.** that included reducing an amount of measurement data in the course of a preprocessing operation; and classifying, in which the preprocessing operation, of the measurement data. The artisan would have been motivated because that would allow eliminating data not necessary to characterize the program.

Response to Arguments

14. Applicants' arguments with respect to 35 USC 103 (a) rejections are not persuasive. In addition, claim rejections under 35 USC 112 First Paragraph and 35 USC 101 are included in this Office Action. Examiners response to the applicants' arguments is presented below.

14.1 As per the applicants' argument that "Klimasauskas does not disclose a method for designing a technical system; rather, the industrial process remains constant; ... no explicit numerical value for the quality of the substitute model (130, 131) is determined on a comparing result; moreover, the primary model 130 and the error correction model 131 remain invariable, accordingly the substitute model is not adapted from a numerical value for the quality to be of as

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high a quality as possible; a hybrid run-time model (122) merely controls the distributed control system (DCS 124), figure 2), which comprises an instrumentation and control computer (90, figure 1) to control the industrial process; this control is performed by controlling respectively adapting MVs”, the examiner respectfully disagrees.

As explained in Paragraph 3.1 and 3.3 above, the Applicants invention claims a method and an apparatus for designing a technical system with no support in the specification. Therefore the examiner has interpreted the claims as a method and an apparatus for controlling a technical system. As explained in Paragraph 4.4 above, Specification Page 7, Para 0041, Lines 12-15 state, “a numerical value for quality characterizes the deviation of the item of the measurement data from the associated value determined by the substitute model”. Therefore, the “measurement data ... quality” and the “numerical value for a quality” are interpreted to be synonymous with the deviation of the measured data from the data predicted by the substitute model.

When these interpretations are applied to the claims, **Klimasauskas et al.** teaches a method for designing a technical system (CL1, L11-12), comprising the steps of:

providing a substitute model that describes measurement data of a predetermined system (CL3, L22-25; CL3, L25-29; CL3, L2-3);

determining a numerical value for a quality of the substitute model by comparing the measurement data of the predetermined system with data determined by the substitute model (CL3, L30-33; CL7, L53-57);

adapting the substitute model from the numerical value for the quality to be as high of a quality as possible (CL3, L40-42; CL6, L42-48); and

applying the substitute model adapted with regard to its quality in a design of the technical system (CL3, L22-37; CL5, L6-9; CL5, L34-45).

14.2 As per the applicants' argument that "Piche does not disclose an explicit numerical value for the quality of the dynamic model 612 on the basis of the comparing result; moreover, Piche does not disclose that the dynamic model 612 being comparable as a substitute model, is adapted from a numerical value for the quality to be of as high a quality as possible; ... the technical plant system remains unchanged; there is no designing of the plant, but there is an optimization of the plant operation by improving the manipulatable variables (MVs) in relationship to the desired controlled variables (CVd).", the examiner has removed the Piche reference in this Office action .

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kandasamy Thangavelu whose telephone number is 571-272-3717. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:30 PM.

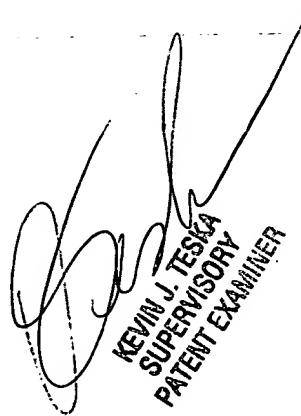
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska, can be reached on 571-272-3716. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-9600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

K. Thangavelu
Art Unit 2123
January 26, 2005



KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER